

CLAIMS

1. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant, comprising:

a detecting device for detecting the position of the teacher;

a signal processing unit for receiving a signal from the detecting device to produce the position information of the teacher; and

a limited speed selecting unit for selecting the operating speed of the robot on the basis of the position information, wherein

the robot is controlled at the maximum operating speed selected by the limited speed selecting unit on the basis of the operation command from the pendant.

2. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position in a position detector attached to each axis, comprising:

a robot position computing unit for computing the coordinate position of the robot on the basis of the

detected position; and

a limited speed selecting unit for selecting the operating speed of the robot on the basis of an output from the robot position computing unit, wherein

5 the robot is controlled at the maximum operating speed selected by the limited speed selecting unit on the basis of the operation command from the pendant.

3. A robot control apparatus equipped with a pendant
10 to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position in a position detector attached to each axis, comprising:

a detecting device for detecting the position of
15 the teacher;

a signal processing unit for receiving a signal from the detecting device to produce the position information of the teacher;

a robot position computing unit for computing the
20 coordinate position of the robot on the basis of the detected position; and

a limited speed selecting unit for selecting the operating speed of the robot on the basis of outputs from the signal processing unit and the robot position
25 computing unit, wherein

the robot is controlled at the maximum operating speed selected by the limited speed selecting unit on the basis of the operation command from the pendant.

5 4. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position by a position detector attached to each axis, comprising:

10 an input unit for inputting a position monitoring signal for monitoring the position of the robot;

a position storage member for storing the detected position when the position monitoring signal is inputted;

15 a permitted value storage member for storing a prescribed permitted range of the operation of each the axis;

a position difference computing member for computing a position difference between the detected position and the detected position stored in the position storage member; and
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a comparing member for comparing the position difference and the permitted range, wherein

while the position monitoring signal is inputted, if the position difference exceeds the permitted range
25 as a result of comparison in the comparing member, the

operation of the robot is stopped.

5. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position in a position detector attached to each axis, comprising

an input unit for inputting a position monitoring signal for monitoring the position of the robot;

10 a position storage member for storing the detected position when the position monitoring signal is inputted;

a permitted value storage member for storing a prescribed permitted range of the operation of each the axis;

15 a position difference computing member for computing a position difference between the detected position and the detected position stored in the position storage member; and

20 a comparing member for comparing the position difference and the permitted range, wherein

while the position monitoring signal is inputted, the detected position is stored after comparison has been made by the comparing member, and if the position difference exceeds the permitted range as a result of comparison in the comparing member, the operation of the

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robot is stopped.

6. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position by a position detector attached to each axis, comprising:

a robot position computing unit for computing a position difference between the coordinate position of the robot on the basis of the detected position;

an input unit for inputting a position monitoring signal for monitoring the position of the robot;

a position storage member for storing the coordinate position when the position monitoring signal is inputted;

a permitted value storage member for storing a prescribed permitted range of the operation of each the axis;

a position difference computing member for computing the coordinate position and the coordinate position stored in the position storage member; and

a comparing member for comparing the position difference and the permitted range, wherein

while the position monitoring signal is inputted, if the position difference exceeds the permitted range as a result of comparison in the comparing member, the

operation of the robot is stopped.

7. A robot control apparatus equipped with a pendant to be manipulated by a teacher, for controlling the operation of a robot on the basis of an operation command from the pendant and a detected position in a position detector attached to each axis, comprising:

a robot position computing unit for computing the coordinate position of the robot on the basis of the detected position;

an input unit for inputting a position monitoring signal for monitoring the position of the robot;

a position storage member for storing the coordinate position when the position monitoring signal is inputted;

15 a permitted value storage member for storing a prescribed permitted range of the operation of each the axis;

a position difference computing member for computing a position difference between the coordinate position and the coordinate position stored in the position storage member; and

a comparing member for comparing the position difference and the permitted range, wherein

while the position monitoring signal is inputted, the coordinate position is stored after comparison has

been made by the comparing member, and if the position difference exceeds the permitted range as a result of comparison in the comparing member, the operation of the robot is stopped.

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8. The robot control apparatus according to any one of claims 4 to 7, wherein

the robot is equipped with a teaching device, and the permitted range can be set by the teaching device
10 or an external control device through a predetermined interface included in the robot control apparatus.

9. The robot control apparatus according to any one of claims 4 to 8, wherein

15 if the position difference exceeds the permitted range, abnormality display or warning display is made on the teaching device.

10. The robot control apparatus according to any one
20 of claims 4 to 9, wherein

it is provided with an output unit, and if the position difference exceeds the permitted range, abnormality display or warning display is outputted outside the robot control apparatus.

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11. The robot control apparatus according to claim 2 or 3, and 6 or 7, wherein

the coordinate position data is a spatial position data at a tip of combined arms of the robot; and

5 the tip is a tip position of a tool whose tool size is known.

12. The robot control apparatus according to any one of claims 1 to 11, wherein

10 the operation of the robot is stopped by making the operation command to each the axis zero, or interrupting driving energy to the robot.

13. A robot system in which a plurality of robots are
15 operated by a plurality of mans so as to permit the position or speed of each robot to be monitored by inputting a position monitoring signal through an input unit of a robot control device, wherein

inputting of the position monitoring signal
20 identifies that another operator operating another robot has entered a predetermined region of a certain robot being operated by an operator, thereby monitoring the position or speed of the robot.